REMARKS

1. In response to the Office Action mailed October 8, 2002, Applicants respectfully request reconsideration. Claims 36, 38, 39, 41, 42, 44, 46-48, 50 and 53-71 were last presented for examination in this application. In the Office Action, all claims were rejected. By the foregoing Amendments, claim 36 has been amended. No claims have been added or canceled. Thus, with entry of this paper, claims 36, 38, 39, 41, 42, 44, 46-48, 50 and 53-71 will be pending in the captioned application. These Amendments are believed not to introduce new matter and their entry is respectfully requested. Further, these amendments have been made to make explicit that which is implicitly recited in the claims as the current stand prior to entry of this paper. Accordingly, the foregoing amendments do not narrow the scope of the claims in any way.

Claim Objections and Rejections Under 35 U.S.C. §112, second paragraph

2. Claims 57-62 and 64-66 were rejected under the second paragraph of 35 USC §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully disagree. The rejected claims recite industry-standard viscosity and adhesion measurement methods and units, which are well-known in the relevant art. The American Society of Testing Materials (ASTM) provides specifications for methods for testing materials. One such industry-standard test for adhesion is cited in the rejected claims. Similarly, Zahn cup efflux time is a industry-standard specification for viscosity. These claimed features are also described in further detail at pages 12-13 (for the viscosity and adhesion of the dielectric coating, recited in claims 57-62) and pages 15-16 (for the viscosity and adhesion of the conductive coating, recited in claims 64-66). It is a well-settled principle that to satisfy the dictates of the second paragraph of section 112, a claim need only be clear to those of ordinary skill in the art. See, for example, *Hybridtech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 USPQ 81 (Fed. Cir. 1986), *cert denied*, 480 U.S. 947 (1987): "Claims need only "reasonably apprise those skilled in the art" as to their scope..." Since the claim language refers to industry-standard measurements and specifications for viscosity and adhesion, those skilled in the art would understand and be reasonably apprised of the scope of claims 57-61 and 64-66. Applicants, therefore, assert that such claims satisfy the requirements of 35 U.S.C.

§112. Accordingly, reconsideration and withdrawal of the Section 112 rejections is respectfully requested.

Claim Rejections Under 35 U.S.C. §102

3. The Examiner rejected claims 36, 38, 39 under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 5,394,304 to Jones (hereinafter "Jones"). Specifically, the Examiner asserts that Jones discloses an electrically continuous conformal coating for providing an EMI-impervious shield ... including a conductive coating ... conformingly and adheringly coating the surface of one or regions of the printed circuit board ...and a dielectric coating interposed between said conductive coating and predetermined portions of each ... printed circuit board region" (*See*, Office Action, pgs. 2, 3, para. 1.) Applicants respectfully traverse these rejections.

4. Jones is directed to a multilayered thermoplastic self-molding "shrink wrap" package for shielding a printed circuit board inserted therein. (*See*, Jones, col. 1, lns. 34-36; Fig. 2.) The Jones thermoplastic self-molding package is comprised of a pair of bags 22, 24 having an electrically conductive metallic layer 26 located between the two bags. (*See*, Jones, col. 2, lns. 16-27; Fig. 4.) The bags 22, 24 form an enclosure 34 into which thermoset resin 38 is injected after insertion of the printed circuit board. An air bleed sprue 36 provides an exhaust path for air to exit enclosure 34 while resin 38 is being injected into the enclosure and while the enclosure is heated and shrinks around the circuit board. (*See*, Jones, col. 2, lns. 27-35.)

5. In contrast to Applicants' claimed invention, the self-molding package of Jones does not conform to the printed wiring board and component surfaces to which it is applied. Rather, Jones' self-molding package forms a molded volume around the printed circuit board having a shape dictated by the more prominent dimensions of the printed circuit board. Thus, Jones' self-molding package significantly changes the dimensions of the printed circuit board regions to which it is applied. (*See*, Jones; col. 1, lns. 44-46.) A specific example of this non-conformal nature of Jones' self-molding package is illustrated in Figures 3 and 5 of Jones. As shown therein, the self-molding package extends from the top surface of component 16 to the top surface of component 20 to form a tent-like structure supported by those components. Thus, the resulting package "self-molds" to a form that <u>does not</u> conform with the surfaces of, for example, component 16, 18 and 20 nor does it conform to the surfaces of the printed wiring board.

Because Jones' shrink-wrapped package does not conform to the surfaces of the printed wiring board, a region or cavity is formed between the components and the package. As noted, resin 38 is injected into enclosure 34 to fill this region, presumably to reduce localized stresses and insure the integrity of the shielding provided by the package. For at least the above reasons, Applicants respectfully assert that the claims pending in this application prior to entry of this paper, are allowable over the art of record. Accordingly, Applicants respectfully request that the Section 102 rejection based on Jones be reconsidered and withdrawn.

6. However, to advance prosecution, Applicants have amended claim 36 to make explicit that which is implicitly recited in the claim. Claim 36, as amended above, recites:

> 36. A printed circuit board comprising:
> a printed wiring board;
> a plurality of components mounted on said printed wiring board; and
> an electrically continuous conformal coating for **conformingly adhering** to surfaces of one or more regions of the printed circuit board to which the conformal coating is applied, comprising,
> a conductive coating that prevents the electromagnetic waves from passing therethrough, said conductive coating **conformingly adhered** to the surface of the one or more regions of the printed circuit board, and
> a dielectric coating interposed between said conductive coating and predetermined portions of each of the one or more printed circuit board regions, wherein said dielectric coating is **conformingly adhered** to and insulates said predetermined portions of the one or more printed circuit board regions,
> **whereby said conductive coating and said dielectric coating each do not significantly change dimensions of said printed wiring board and said plurality of components mounted thereon in said one or more printed circuit board regions to which said conformal coating is applied.**
>
> (*See*, amended claim 36, above; emphasis added.)

7. For at least the reasons noted above, Applicants respectfully assert that Jones neither discloses, teaches nor suggests that which is recited in amended independent claim 36. Specifically, Jones neither discloses, teaches nor suggests providing conductive and dielectric coatings that conformingly adhere to the surface of the one or more regions of the printed circuit board without significantly changing the dimensions of the printed wiring board and components to which the coatings are applied. Accordingly, Applicants respectfully request that such clarifying language makes explicit the conformal nature of Applicants' dielectric and conductive coatings, providing further basis for allowing claim 36.

Rejections Under 35 U.S.C. §103(a)

8. The Examiner has maintained the rejection of claims 36, 38, 39, 41, 42, 44, 46-48, 50, 53-56, 63 and 67-71 under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,218,610 to Suzuki (hereinafter "Suzuki") in view of U.S. Patent No. 5,703,761 to Heiss (hereinafter "Heiss"). Applicants respectfully traverse these rejections as well.

9. Suzuki is directed to a rigid plastic structure 300 for shielding an electronic circuit from radio waves which is open on one side 310 with an interior surface 320 that is stepped to form a surface for receiving a printed circuit board 200. (*See*, col. 2, lns. 6-10; Fig. 2B) Once received, the printed circuit board 200 closes the open side 310 of the shield case 300. (*See*, col. 4, lns. 28-39.) The inner surface of the shield case 300 is formed of a conductive layer 330. The circuit board includes an inner layer 210 of metal foil which provides shielding properties. (*See*, col. 4, lns. 42-45.) A radio frequency circuit block 220 is located on a lower surface of printed circuit board 200 with antennas 221, 222 formed on the upper surface. When installed in shield case 300, the radio frequency circuit block 220 is shielded on five sides by the shield case 300 and on the sixth by conductive inner layer 210. (*See*, col. 4, lns. 41-61; col. 5, lns. 33-38.) As shown in Figure 5 there is a large, shielded cavity in which the component 220 is disposed.

10. Contrary to the Examiner's assertions, Suzuki's conformal coating 330 is not applied to printed circuit board 200 and thus does not meet at least the limitation of being conformingly adhered to the surface of the one or more regions of the printed circuit board, as recited in claim 36. Rather, Suzuki's conformal coating 330 is formed in or applied to the inner surface of shield case 300 which does not contact the shielded component. (*See*, Suzuki, col. 5, lns. 49-58; Fig. 5.) Thus, Applicants respectfully assert that Suzuki neither teaches nor suggests a conformal coating as recited in amended claim 36.

11. Heiss does not disclose that which is missing from Suzuki. Heiss is directed to a shield for flat modules. Heiss discloses a deep-drawn plastic film 5 laminated on its exterior side with a metal film 4 is in the form of a clam shell adapted to receive a printed circuit board 2. As with Suzuki, the Heiss conductive coating does not conformingly adhere to the surfaces of printed circuit board 2 and components 1. In the case of Heiss, the conformal coating 4 is applied to the exterior of the casing 5. As in the Suzuki arrangement, there is a space or cavity formed by the shield case 5 in which the circuit board 2 resides. (*See*, Heiss, col. 1, ln. 26 – col. 2, ln. 53.) In the embodiment illustrated in Figure 2 of Heiss, a non-conductive material 7 fills this cavity. The non-conductive layer 7 of Heiss, therefore, does not conformingly adhere to the surfaces of the coated printed circuit board regions, as recited in claim 36.

12. The motivation relied upon by the Examiner for combing the teachings of Suzuki and Heiss is to serve the "purpose of reducing the space requirement to a minimum." A careful reading of Heiss reveals that there are two disclosed embodiments illustrated in Figures 1 and 2, respectively. The cited portion of Heiss is a summary of the second embodiment which is described at column 2, lines 27-44 of Heiss. There, a non-conductive layer 7 fits the contours of the flat module, forming a rectangular-shaped volume encasing the flat module, as shown in Figure 2. A conductive surface 6 is applied to the planar exterior surface of non-conductive layer 7. The noted improved capability of reducing the space requirement for the shielding is a statement made in Heiss to distinguish between the two disclosed embodiments. The full sentence in Heiss is as follows: "In this construction, a pre-production of the shielding is not possible (as it is in the first disclosed embodiment); however, this (second) embodiment offers the advantage that the space requirement for the shielding can be reduced to a minimum (as compared to

the first disclosed embodiment)." (*See*, Heiss, col. 1, lns. 54-58; parentheticals added.) This stated difference is believed to be directed to the fact that the plastic film casing of the first embodiment can be pre-manufactured to encase a number of different-sized flat modules and, as such, will be larger than necessary for certain flat modules. The second embodiment, in contrast, is formed directly on the flat module and, as such, can be formed so as to have a minimum size. This statement provides no motivation to include the use of Heiss' dielectric coating in the Suzuki rigid shield. Accordingly, Applicants respectfully assert that no legitimate rationale for modifying Suzuki, let alone that it be modified as suggested by the Examiner, has been set forth by the Examiner. For these reasons alone, Applicants respectfully request that the Section 103 rejection of independent claim 36 be reconsidered and withdrawn.

13. Further, even if there was a suggestion to add Heiss' dielectric coating to Suzuki, the dielectric coating would do nothing more than fill the cavity formed between Suzuki's rigid casing 300 and the shielded component 220. With regard to the conductive coating, Suzuki is directed only to a rigid shielded cage with an interior surface coated with a conductive coating. That surface is spaced away from the printed circuit board to form part of the noted shielded enclosure. As noted, the Heiss conductive coating is applied to the exterior surface of the plastic shield or dielectric block surrounding the printed circuit board. Thus, the conductive layers disclosed in Suzuki and Heiss do not conform with nor do they adhere to the surface of their respective printed circuit boards without significantly changing the dimensions of the printed wiring board and components to which it is applied. With regard to the dielectric coating, Suzuki, as acknowledged by the Examiner, neither teaches nor suggests using such a coating. The dielectric coatings of Heiss is non-conformal and forms a rectangular volume that is substantially larger than the flat module to which it is applied. Thus, the dielectric coating of Heiss significantly changes the dimensions of the components and printed wiring board to which it is applied. Thus, the device resulting from the combination of Suzuki and Heiss would not contain a conformal EMI shield with conductive and dielectric coatings that conformingly adhere to the surfaces of the printed circuit board, as recited in amended claim 36.

14. Thus, Applicants respectfully assert that Suzuki taken alone or in combination with Heiss neither teaches nor suggests the features of Applicants' invention as recited in independent claim 36. For this reason alone, Applicants respectfully assert that the

Section 103 rejection of independent claim 36 is improper. Accordingly, Applicants respectfully request that the rejection of independent claim 36 be reconsidered and withdrawn. As with the above response to the Section 102 rejections, Applicants assert that the above amendments, make explicit the implicit characteristics of the term "conformal," provide a an explicit recitation clearly differentiating the claimed invention over the applied art. Independent claim 36, as amended, is clearly patentable over the art of record.

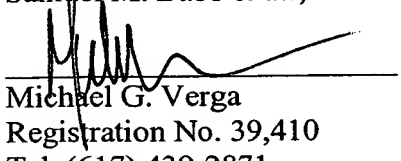
Dependent Claims

15. Dependent claims 38, 39, 41, 42, 44, 46-48, 50 and 53-71 incorporate all of the subject matter of independent claim 36 and add additional subject matter which makes them a fortiori and independently patentable over the art of record. Accordingly, Applicants respectfully request that the rejections of the dependent claims be reconsidered and withdrawn.

CONCLUSIONS

16. In view of the foregoing Amendments, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after entering this paper into the record, that an interview will facilitate prosecution of this application, the Examiner is requested to call the Applicants' representative at the number provided below.

Respectfully submitted,
Samuel M. Babb *et al.*,



Michael G. Verga
Registration No. 39,410
Tel. (617) 439-2871
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MARKED UP VERSION OF CLAIMS SHOWING ALL CHANGES MADE

[ATTACHMENT TO THE AMENDMENT AND RESPONSE FILED IN RESPONSE TO THE OFFICE ACTION DATED OCTOBER 8, 2002 IN U.S. PATENT APPLICATION 09/812,274.]

36. (Three Times Amended) A printed circuit board comprising:

a printed wiring board;

a plurality of components mounted on said printed wiring board; and

an electrically continuous conformal coating for conformingly adhering to surfaces of one or more regions of the printed circuit board to which the conformal coating is applied, comprising,

a conductive coating that prevents the electromagnetic waves from passing therethrough, said conductive coating conformingly adhered to the surface of the one or more regions of the printed circuit board, and

a dielectric coating interposed between said conductive coating and predetermined portions of each of the one or more printed circuit board regions, wherein said dielectric coating is conformingly adhered to and insulates said predetermined portions of the one or more printed circuit board regions, whereby said conductive coating and said dielectric coating each do not significantly change dimensions of said printed wiring board and said plurality of components in said one or more printed circuit board regions to which said conformal coating is applied.

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